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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/844,481	04/27/2001	Yasuhiko Onishi	FUJI:185	9134

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EXAMINER

LANDAU, MATTHEW C

ART UNIT PAPER NUMBER

2815

DATE MAILED: 11/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/844,481

Applicant(s)

ONISHI ET AL.

Examiner

Matthew Landau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-17,31 and 33 is/are pending in the application.
- 4a) Of the above claim(s) 5,8-13,15-17 and 33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,6,7,14, and 31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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DETAILED ACTION

Election/Restrictions

Claims 5, 8-13, 15-17, and 33 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 7.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 2, 4, 6, 7, 14, and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regards to claims 1, 2, and 6, the limitation “formed in a laminated direction of the first semiconductor regions and the second semiconductor regions” renders the claim indefinite. It is unclear what is meant by the phrase “laminated direction”. While Applicant can be his own lexicographer, there is no disclosure in the specification of a laminated direction or a lamination process, therefore it cannot be determined what Applicant’s intends to claim by having the closed loop “formed in a laminated direction”.

Further regarding claim 7, it is unclear how the first pitch can be equal to the second pitch. Claim 6, from which claim 7 depends, requires the first and second pitch be different. Note that claim 7 as presented does not correspond with the version presented in the previous amendment, even though there is no indication of a new amendment.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawaguchi et al. (US Pat 6,297,534, hereinafter Kawaguchi) in view of Bhatnagar et al. (US Pat. 5,710,455, hereinafter Bhatnagar).

In regards to claims 1 and 4, Figure 1 of Kawaguchi discloses a semiconductor chip; two main electrodes (9 and 10) on one major surface of the semiconductor chip; and an alternating conductivity type layer (4/5) between the main electrodes; wherein the alternating conductivity type layer comprises first semiconductor regions 4 of a first conductivity type and second semiconductor regions 5 of a second conductivity type; wherein the first semiconductor regions and the second semiconductor regions are alternately arranged in a surface portion of the major surface; and the lateral width of the first and second semiconductor regions is the same. The difference between Kawaguchi and the claimed invention is the alternating conductivity type layer comprises a closed loop formed by the first and second semiconductor regions alternately arranged along the direction of the closed loop and surrounding one of the main electrodes, and wherein the alternating conductivity type layer comprises at least two straight sections and at least two curved sections. Figures 1 and 2 of Bhatnagar disclose a lateral semiconductor device

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with a semiconductor region between two main electrodes (15 and 17); wherein the semiconductor region forms a closed loop surrounding one of the main electrodes (17), and wherein the semiconductor region comprises two straight sections and two curved sections. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Kawaguchi by using the closed loop configuration of Bhatnagar for the purpose of eliminating the need for any special edge termination outside the device (column 6, lines 1-9). As best the examiner can ascertain the claimed invention, when the closed loop configuration of Bhatnagar is combined with Kawaguchi, the combination discloses formed in a laminated direction of the first and second semiconductor regions.

In regards to claim 31, Figure 1 of Kawaguchi the lateral semiconductor device comprises a MOSFET (column 5, lines 51-55). It is further obvious in the invention of Kawaguchi and Bhatnagar to use the configuration of Bhatnagar wherein the high potential main electrode 17 is inside the closed loop and the low potential main electrode 15 is outside the closed loop (column 6, lines 1-9) for the purpose of containing the high voltage drain region inside the device.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawaguchi in view of Bhatnagar as applied to claim 1 above, and further in view of Magri et al. (US Pat. 6,492,691, hereinafter Magri).

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A further difference between Kawaguchi and the claimed invention is a plurality of closed loops. Figure 1 of Magri discloses forming a plurality of closed loops on a single chip. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to further modify the invention of Kawaguchi by including a plurality of closed loops on the chip for the purpose of increasing integration density.

Allowable Subject Matter

Claims 2 and 6 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

Claims 7 and 8 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed August 4, 2003 have been fully considered but they are not persuasive.

In response to Applicant's arguments regarding the 103 rejection of Kawaguchi in view of Bhatnagar that Bhatnagar "does not disclose a closed loop formed by alternating the first and second semiconductor regions", Kawaguchi discloses the alternating first and second regions. Bhatnagar is merely relied upon for the closed loop configuration. In response to Applicant's

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argument that the drift region 14 of Bhatnagar is not a loop, but merely isolated as an island, Figures 1 and 2 of Bhatnaga disclose the surface portion of the drift region 14 is can be considered a closed loop with drain contact region 20 in the center of the loop.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Landau whose telephone number is (703) 305-4396.

The examiner can normally be reached from 8:30 AM - 5:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the organization where this application or

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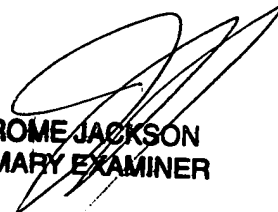
proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Matthew C. Landau

Examiner

November 12, 2003



**JEROME JACKSON
PRIMARY EXAMINER**